

Visit to Cawthron Institute - Glenhaven Aquaculture Centre New Zealand

Janet H Brown reports

Visiting the Glenhaven Aquaculture Centre (GAC) was some day; not only meeting with a former student from 23 years ago, enough for a day of reminiscences alone but in an aquaculture centre where shellfish is king – this was bliss indeed! Cancel lunch; far too much talking to do.

Achim Janke has been in New Zealand for 16 years almost all of which time has been spent working at the Cawthron Institute in Nelson in the north of the South Island. He started in the aquaculture branch of this (the GAC) when there were just 3 people working there; the group is now over 30. I was fortunate visiting when I did since they were now all well settled into newly expanded premises complete with offices (something they apparently managed without before!) enjoying enviable views over the Tasman sea or of the hills behind Nelson. With even the expanded staff complement there was clearly a collegiate approach and it was also clear that this approach is very much also with the shellfish industry as a whole. I did not visit the main offices of the Institute in Nelson itself where they also cover biotoxin monitoring and shellfish pathology but maybe I can do this another time!

There is so much scope for the Scottish industry to learn from what they are doing but as an export based industry in NZ the GAC are dealing with large shellfish farming companies, a striking difference. But there is no reason why cooperatives cannot think like companies so the GAC would certainly be a place to visit, and I got the real impression that they would be interested to have such a visit. I can only give a brief overview of what they are doing here just to whet your curiosity I hope.

The *gigas* industry is probably younger than that of the UK but with significantly different origins in that their *gigas* simply “arrived” and most of the industry consequently depends on wild caught spat. Achim is very keen to work with industry to change this since he believes “single seed” culture is the way to get the best product. He has so much information on oyster growth which would probably resonate with our growers experience but so often constraints of practical requirements make them impossible to put into practice.

The use of wild spat means selective breeding is not possible and selective breeding is a special interest of the GAC. This work on oysters

started some 13-14 years ago on a family based approach but they breed from individual oyster lines so that inbreeding is never possible. They also work on cryopreservation so that back crosses are possible. The cryopreservation work has been developed for abalone and mussels also. There has been some resistance to taking on hatchery bred oysters since this involves higher costs than the traditional system used of farming wild caught oysters but Cawthron is working with industry and has shown that benefits outweigh costs. Hatchery accredited spat will become more attractive possibly also with the arrival of OHV which became apparent last November; even to Cawthron’s consternation in the hatchery in Glenhaven. However, Cawthron is now confident that it has found the answer to this and is now successfully rearing virus free spat from virus carrying adults.

Achim has been leading a project to establish 3N spat for the NZ oyster industry. This new induction method produces 100% triploid oysters using non-toxic methods and as this instant induction method involves 2N oysters it has a huge additional advantage in permitting advantage to be taken of genetic gains from selective breeding. Triploids and selective breeding are two pathways industry considers important to address the current problems with the oyster Herpes virus. There is not the same pressure in New Zealand against *C. gigas* as can be detected in some parts of Europe which in view of their awareness of non-native species is quite surprising but the benefits of triploids are seen more to be in terms of improved performance.

A lot of the work that Cawthron has done with the oysters is now being applied to the mussel industry – a far bigger industry with value of production around NZ\$200-250 million, that is roughly £100-125million. The mussel industry currently still relies on wild caught spat but to get benefits from breeding mussels, hatchery production is essential. Mussels from 90 miles beach come down to the farms at 300-800microns size on weed – 1 kg weed may contain between 1-1.5 million spat. Of these wild spat maybe 1-1.5% make it to adult product so for hatchery production to be viable they had to improve the retention radically. They have managed to improve retention to over 50% which makes hatchery production paired with



selective breeding a viable proposition now. Three leading mussel companies in NZ have pulled their resources together to form SPATNZ which with some 50% government assistance will spend over NZ \$50 million over the next 7 years to establish amongst others a large hatchery to supply genetically improved mussel spat for their farm operations.

They have already demonstrated differences in performance, faster growth, better meat content, better shell characteristics; basically it becomes a question of not being able to afford not to use hatchery spat. As an export based industry they also cannot afford not to have product available all year round. By judicious breeding between the different strains this can be managed. For example the time from the final sorting at the 40-50mm size to market size can be a year for the Golden Bay stock while it can twice that long for the Kaitaia stock. So careful allocation of stocks with timings can almost fill all the gaps with good management. There are still some difficulties for 1-2 months but they envisage being able to fill this with use of triploid stocks. Cawthron is working with a consortium of 3 of the biggest shellfish companies to develop the hatchery and work is ongoing on how to scale up processes developed in the centre to a commercial scale.

There were so many innovations in the hatchery there isn't time to describe them all. I was particularly impressed with the system developed by Nick King who had spent some of his career in the NZ apple industry before returning to his first love of shellfish – and from the control systems used in the apple industry he has developed systems in GAC for real time measurement of chlorophyll A, pH dissolved oxygen and temperature in the algal ponds, which provide the feed for the spat, but also controls for every system in the lab. They use pneumatic valves so provide algal dosing far cheaper than could ever be set up using peristaltic pumps but being controlled via the computer any researcher can ask for precisely the feeding regime for his or her tanks. (see photos).

Other systems to catch my eye was the system devised by Norman Ragg to wire into the heart of a mussel to measure the effects on its heart rate of external factors, and invaluable research tool.

This combination of real science with applied research, contract research and a real day to day involvement with the cutting edge of the industry makes the GAC an exciting environment that they can all be very proud of. This was one very impressed visitor.

Illustrations: On facing page Achim Janke with his spat growing system.

From top right this page; Mini pneumatic pumps replace peristaltic pumps for automated feeding. Sieve of all mesh sizes: Nick King in front of the computer that controls every system in GAC; Nick King with Norman Ragg deep in discussion with a view to enhance thought and bottom picture, some young spat.

